A NEW SUBSPECIES OF ACILIUS (COLEOPTERA: DYTISCIDAE) FROM THE SOUTHEASTERN UNITED STATES[1]

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ABSTRACT: *Acilius fraternus dismalus* n. subsp. is described from Virginia and North Carolina and the intergradation with typical *A. fraternus* is discussed.

DESCRIPTORS: Aquatic insect, Coleoptera, Dytiscidae, distribution, intergradation.

The members of the genus *Acilius* are moderately large aquatic beetles which may be separated from closely related genera by the dense punctation on both the dorsal and ventral surface. The body is broadened and flattened in the posterior third and the elytra usually have a subapical yellow fascia. Members of the genus are characteristic of shaded woodland pools and are only occasionally found in other habitats.

The *Acilius* occuring in northeastern United States were discussed by Hilsenhoff (1975) and a new species from the northern United States and Canada was described. In Hilsenhoff's treatment of the genus, *Acilius fraternus* was characterized as "a southern species ranging north to Massachusetts, southern Ontario, southern Michigan, southern Wisconsin and Iowa. A key and supplementary characters were presented for separating the species of *Acilius* found in the northeastern North America.

Extensive collecting in eastern Virginia and North Carolina has revealed the existence of a population of *Acilius* distinct in several respects from typical *A. fraternus* and that form is herein described as a new subspecies.

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Acilius fraternus dismalus, new subspecies

Holytype female: Length 15.3 mm, width 8.4 mm. widest at the second abdominal segment. Size range of type material: length 12.4 to 16.0 mm, width 6.8 to 8.7 mm. **Head:** Entire ventral surface rufus; area between the eyes with an obscure rufopiceous M mark; posterior border narrowly obfuscate; dorsum of head densely covered with fine punctures, the punctures of the posterior margin somewhat courser. **Pronotum:** Lateral margins forming a continuous line with elytra; the margins without an enlarged rim. Antereolateral angles projecting forward to the level of the eyes; rufus, with two transverse black lines on disc; anterior one longer, extending posteriorly parallel to the lateral margin to the level of the posterior line; the lines separated from the margin by a distance slightly greater than their width; the posterior line only extending over the middle two-thirds of the disc. The disc densely covered by the irregularly spaced punctures; the area between the punctures with reticulate sculpturing. **Elytra:** Not sulcate; ground color rufotestaceous; with many dark spots which are so closely applied that they overlap and are broadly interconnected, especially on the disc. A posterior pale fascia occurs but is partially obliterated. The disc of the elytra is densely punctate, the punctures separated by a distance of less than one-half the width of a puncture, gradually becoming more widely spaced laterally and less distinct posteriorly. The area between the punctures microreticulate. **Venter:** Head rufopiceous, prosternum piceous, anterior half of the prosternal process rufus, posterior half infuscate; pro and mesothoracic legs rufotestaceous. Metasternum and coxal plates pisceous without a reddish cast. The coxal lobes rufopiceous, hind trochanter rufus, femora piceous with a narrow basal rufus area. Abdomen piceous, segments 3-5 with small rufus spots laterally, posterior margins with a rufus tinge. Entire ventral surface (except head) densely punctate; the area between the punctures microreticulate. **Allotype male:** Similar to the female in color and body form except as follows: 1) postmedian pale fascia of the elytra distinct, 2) prosternal process broadly margined in black but not completely infuscated in the posterior portion, 3) length 13.5 mm, width 8.1 mm. **Male tarsi:** Anterior protarsal claw unmodified, tarsal expansion with one large and two small adhesion discs; the small discs subequal in size and slightly greater than half the diameter of the large disc. The first three mesotarsal segments with a small inconspicuous tuft of golden cilia on the inner apical margin. **Male genitalia:** (Figure 1) length 1.8 mm, parameres slightly longer than the aedeagus; the ventral and inner margins with large fleshy lobes which partially enclose the aedeagus; the dorsal and outer sides well sclerotized to the tip. Aedeagus enlarged basally, rod-like for the distal three-fifths, with small lateral flanges which are poorly sclerotized, with a dorsal groove and a U shaped notch at the tip. **Types:** The holotype female and the allotype male were collected from a large woodland pool in the Dismal Swamp, City of Suffolk, Virginia on August 6, 1970. Paratypes are designated from the following localities: Dismal Swamp, 23 females, 27 males; Chesapeake, Va. 3 females, 4 males; Virginia Beach, Va. 1 female; Gates Co., N.C. 1 male; Pungo Lake, N.C., 1 female; Havelock, N.C. 3 females, 3 males. Collection dates range from March 2 to December 31. The primary types are retained in the authors'

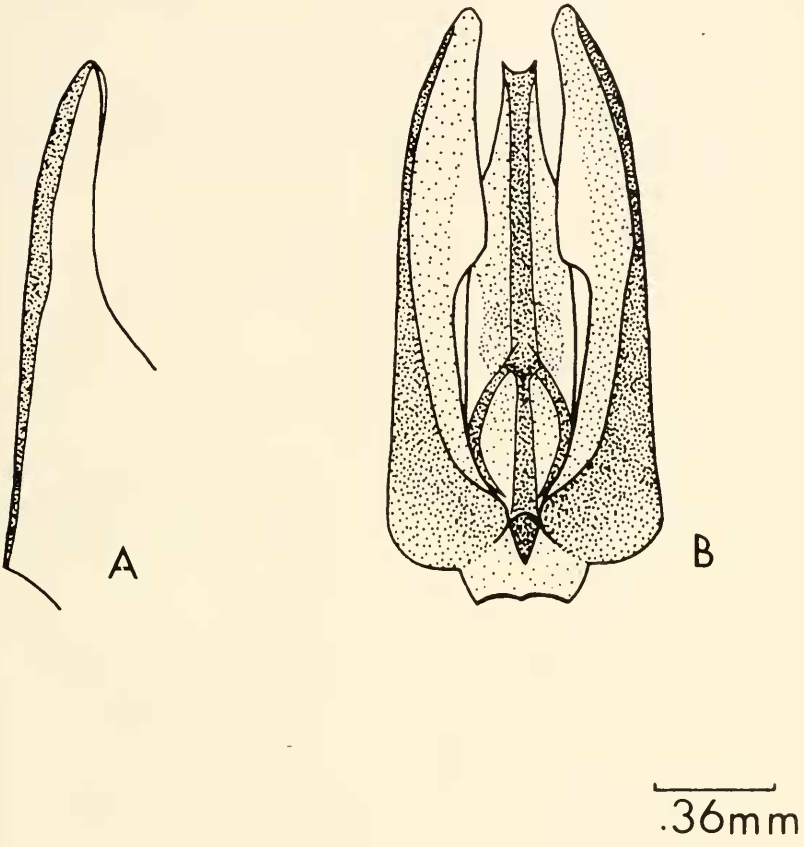

Figure 1. Male genitalia of *Acilius fraternus dismalus*. A. Dorsal view of left paramere. B. Ventral View of parameres and aedeagus.

collection; paratypes have been deposited with the National Museum of Natural History, the Harvard Museum of Comparative Zoology, The Canadian National Collection, the California Academy of Science, and North Carolina Department of Agriculture Museum.

Acilius fraternus dismalus will key out to *Acilius fraternus* in Hilsenhoff's (1975) key to the northeastern species and may be distinguished from typical *A. f. fraternus* by the following comparative characters:

A.f. fraternus	*A.f. dismalus*
1. Approximately 50% of the females with elytral sulci	1. Females never sulcate
2. Prosternal process usually narrowly margined with black, rarely infuscate at apex	2. Prosternal process more broadly margined, usually with the apex partially infuscated, occasionally more broadly infuscated.
3. Dorsum lighter, with a reddish brown cast	3. Dorsal surface darker, with a dark brown cast
4. Postmedian pale fascia usually distinct	4. Postmedian pale fascis usually indistinct, occasionally almost completely obliterated.
5. Coxal plate and metasternum reddish brown, occasionally piceous but with a reddish cast	5. Coxal plates and metasternum piceous, without reddish cast
6. Abdomen reddish brown	6. Abdomen piceous, the distal margins of each abdominal segment with a reddish brown tinge.

The known distribution of *Acilius fraternus dismalus* is the southeastern coastal plain of Virginia and the coastal plain of North Carolina; however, the characteristics of *A. f. dismalus* are similar to those described by Young (1954) for Florida specimens

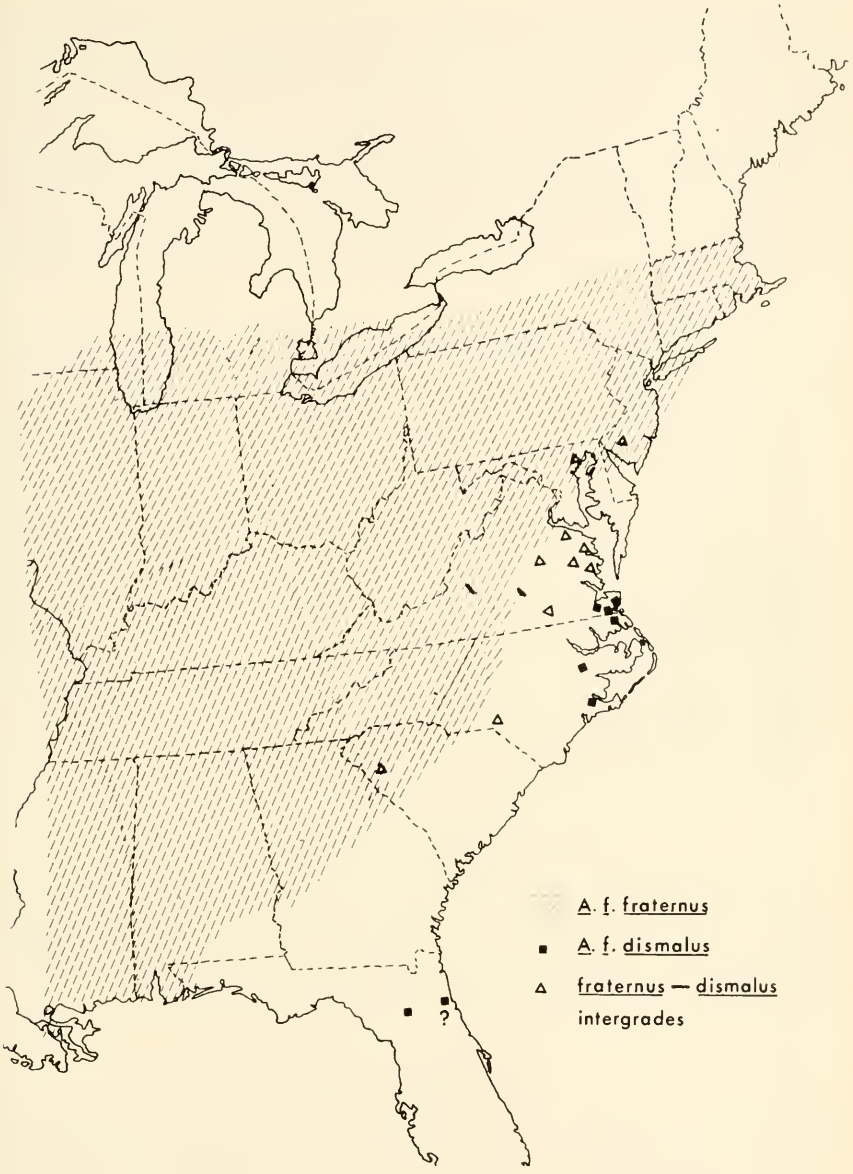

Figure 2. Distribution of *Acilius fraternus fraternus, A. f. dismalus* and *fraternus-dismalus* intergrades.

of *fraternus*. It is probable that Young was dealing with *dismalus*, and that the subspecies ranges from southeastern Virginia to Florida. It is probable that the origin of this subspecies is similar to the origin of *Matus ovatus blatchleyi* as described by Young (1954). Ancestral stock, isolated in Florida during the Pleistocene glaciation, evolved away from the typical subspecies. This new subspecies has gradually expanded northward in recent times and has developed a broad zone of intergradation with the typical subspecies.

Intergrades between the typical *fraternus* and *dismalus* typically have a slightly reddish cast to the metasternum and coxal plates. Occasionally females from intergrade populations will be sulcate. Figure 2 shows the distribution of *Acilius fraternus fraternus*, *A. fraternus dismalus* and intergrade populations in the eastern United States.

An examination of the distribution of intergrades indicates that the zone of intergradation consists of the eastern Virginia coastal plain north of Hampton Roads and south of Fredricksburg with minor salients to the northeast into Maryland and New Jersey, and the area adjacent to the fall line in southern Virginia and the Carolinas. Additional collecting in the Gulf coast states is needed in order to determine the relationship between typical *fraternus* and *dismalus* in that area.

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